

VELOCITY
SOFTWARE

Visualization is Key

Rich Smrcina
Velocity Software, Inc
VM Workshop – June, 2026

Velocity Software, Inc.
info@velocitysoftware.com

Copyright © 2026 Velocity Software, Inc. All Rights Reserved. Other products and company names mentioned herein may be trademarks of their respective owners.

Performance Management

Visualization

Infrastructure

Grafana

VSIPUMP

Updates to support Open Telemetry

References to zVPS and tools provided by Velocity Software

Performance Monitoring is integral to IBM Z operating systems

- Well documented, standardized interfaces
- Real time and historical data is made available
 - Via various performance management software
- Show current performance and historical trends

Performance Management interfaces

- CP Monitor on z/VM
- RMF/SMF on z/OS (DMF on VSEn)
- Net-SNMP everywhere

Performance Management

- Performance Analysis
- Operational Alerts
- Capacity Planning
- Accounting/Charge back

Correct data (Virtual Linux CPU data wrong - SMT)

Capture ratios (is the data valid?)

- Compare data from multiple sources

Three kinds of performance monitor products

- Used for performance management
- Used for diagnostics
- Turned off when there's a performance problem

Management can not be the problem....



Single pane of glass

- No enterprise has only one platform
- One user interface minimizes learning curves
- Evaluate multiple systems, networks, platforms in one view

Minimize Overhead of performance management

- Processor costs of performance management can be large
- Many installations run 15-minute granularity to reduce overhead
- “Only run this when there is a problem” is not performance management

A target of less than 1% of CPU resource for performance management is a reasonable target

Traditional way to look at data

- Handles z/VM, Linux, Applications, Network, VSE, and z/OS on individual screens
- All with one easy to use interface
- Familiar and comfortable

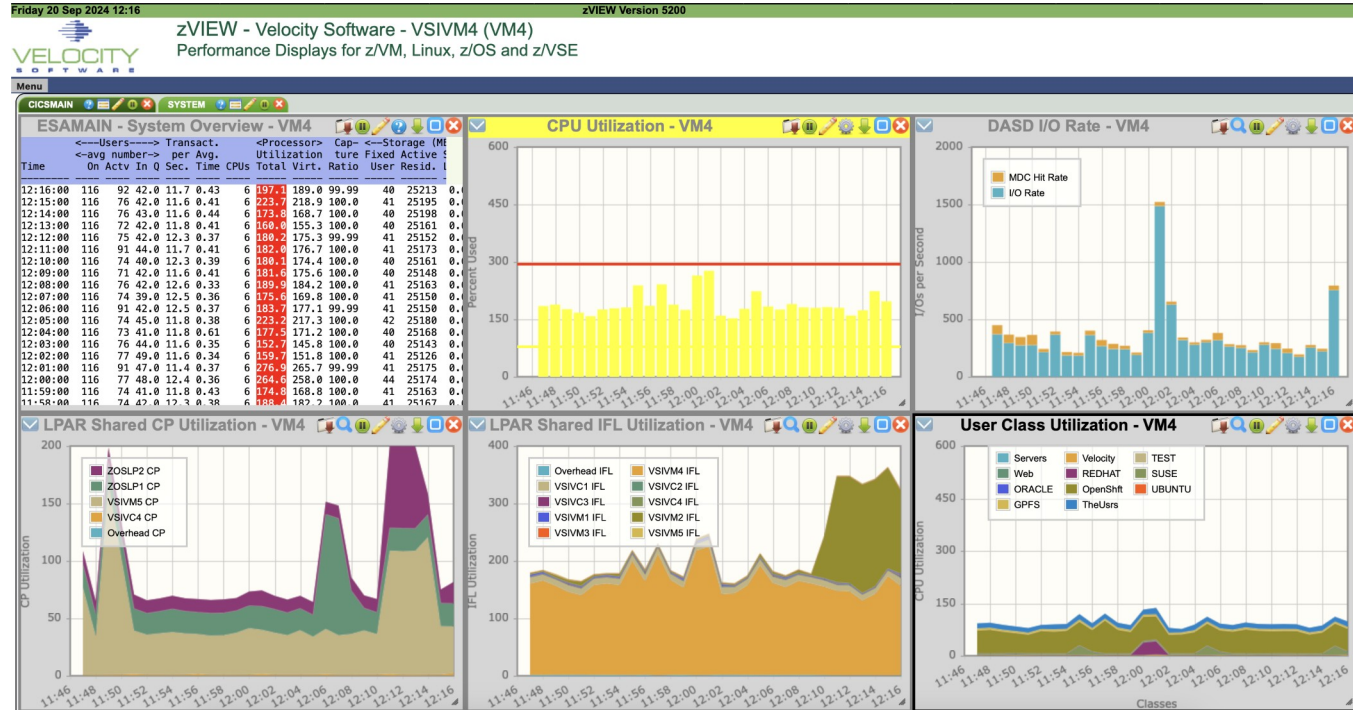
```
VSIVM4 (TN3270.zoc)
Screen: ESAMAIN Velocity Software - VSIVM4 ESAMON 5.140 11/02 12:30-13:00
1 of 3 System Overview 192.168.8.153 Time: 18:35:00 8562 040F78

<---Users----> Transact. <Processor> Cap- <--Storage (MB)-->
<-avg number-> per Avg. Utilization ture Fixed Active Stor
Time On Actv In Q Sec. Time CPUs Total Virt. Ratio User Resid. Load
*-----*-----*-----*-----*-----*-----*-----*-----*-----*
13:01:00 120 101 50.0 15.2 0.39 6 338.0 325.7 100.0 39 23312 0.6
13:00:00 120 73 55.0 15.7 0.39 6 321.3 310.7 100.0 38 23299 0.6
12:59:00 120 69 41.0 16.3 0.39 6 248.1 239.4 100.0 39 23268 0.6
12:58:00 120 74 43.0 15.7 0.42 6 299.8 289.0 100.0 38 23292 0.6
12:57:00 120 73 44.0 16.6 0.37 6 264.6 258.8 100.0 38 23278 0.6
12:56:00 120 95 50.0 16.1 0.44 6 258.6 252.9 100.0 38 23289 0.6
12:55:00 120 73 42.0 15.6 0.38 6 331.5 324.1 100.0 38 23287 0.6
12:54:00 120 71 40.0 16.2 0.42 6 265.3 258.7 100.0 38 23299 0.6
12:53:00 120 70 54.0 16.2 0.39 6 249.5 244.1 99.99 38 23282 0.6
12:52:00 120 73 43.0 16.3 0.39 6 234.6 229.2 100.0 38 23267 0.6
12:51:00 120 95 40.0 16.3 0.41 6 227.3 220.7 100.0 38 23244 0.6
12:50:00 120 74 47.0 16.3 0.38 6 229.9 223.9 100.0 39 23287 0.6
12:49:00 120 74 43.0 15.9 0.47 6 255.9 250.4 100.0 38 23299 0.6
12:48:00 120 72 41.0 15.5 0.36 6 246.7 241.0 100.0 38 23284 0.6
12:47:00 120 79 45.0 16.3 0.38 6 261.8 254.9 100.0 39 23279 0.6
12:46:00 120 94 43.0 15.0 0.47 6 300.9 293.2 100.0 38 23287 0.6
12:45:00 120 72 44.0 15.4 0.41 6 337.6 332.9 100.0 38 23305 0.6
12:44:00 120 69 43.0 15.7 1.12 6 309.2 304.0 100.0 38 23298 0.6
12:43:00 120 72 39.0 14.8 0.38 6 284.8 278.2 100.0 38 23288 0.6
12:42:00 120 74 42.0 16.3 0.31 6 247.9 242.7 100.0 37 23285 0.6
12:41:00 120 95 39.0 15.3 0.38 6 244.4 238.9 100.0 37 23301 0.6
12:40:00 120 69 43.0 15.5 0.34 6 238.1 232.1 100.0 38 23286 0.6
12:39:00 120 69 41.0 15.2 0.36 6 245.6 240.3 100.0 38 23256 0.6
12:38:00 120 70 47.0 15.8 0.34 6 256.3 250.2 100.0 38 23259 0.6
12:37:00 120 76 49.0 15.7 0.34 6 232.5 227.1 100.0 38 23272 0.6
12:36:00 120 96 41.0 16.1 0.33 6 281.5 275.2 100.0 38 23291 0.6
12:35:00 120 72 42.0 15.8 0.33 6 274.5 268.6 100.0 38 23280 0.6
12:34:00 120 69 43.0 16.2 0.30 6 250.8 244.9 100.0 38 23272 0.6
12:33:00 120 70 44.0 15.6 0.53 6 291.2 285.7 100.0 37 23276 0.6
12:32:00 120 74 48.0 14.4 0.40 6 308.9 301.1 100.0 38 23266 0.6
12:31:00 120 95 53.0 13.8 0.45 6 274.1 261.0 100.0 38 23290 0.6

PF1=Help PF2=ESAMMENU PF3=Quit PF4=Select PF5=Plot PF6=ESATOC
PF9=Sort PF10=Parms PF11=More PF12=Cancel
=====
3279 VSIVM4 08/001
```

Web based display

- Individual windows for tabular data or graphs
- Standard set of graphs and graph types
- Multiple systems can be displayed
- Any data can be mixed (VM, Linux, VSE, z/OS)
- Users can save their own view of data



Customers ask for more modern visualization tools

- Up to date displays
- Better graphics
- Familiar to a wider audience

The volume of the data is the problem

- The CP Monitor and SNMP provide all of the data every minute
- IBM z based tools are designed to display the data
 - In a manner typical for the platform
- Typically raw tabular displays and graphs
- Hundreds of screens and thousands of various metrics

The tools used are InfluxDB and Grafana

InfluxDB 1.10 was tested

Grafana 9.5.5

They can be installed together or separately

On InfluxDB, create a user

```
create user vsi with password 'velocity' with all privileges
```

Create a database called 'zvm'

```
create database zvm
```

Create a database connection in Grafana

Home > Connections > Your connections > Data sources > InfluxDB

Connections

Connect data

Your connections

Data sources

InfluxDB

Type: InfluxDB

Settings

Alerting supported

Name: InfluxDB Default

Query Language: InfluxQL

HTTP

URL:

Allowed cookies: Add

Timeout:

Auth

Basic auth With Credentials

TLS Client Auth With CA Cert

Skip TLS Verify

Forward OAuth Identity

Basic Auth Details

User:

Password: Reset

Database:

User:

Password: Reset

HTTP Method:

Min time interval:

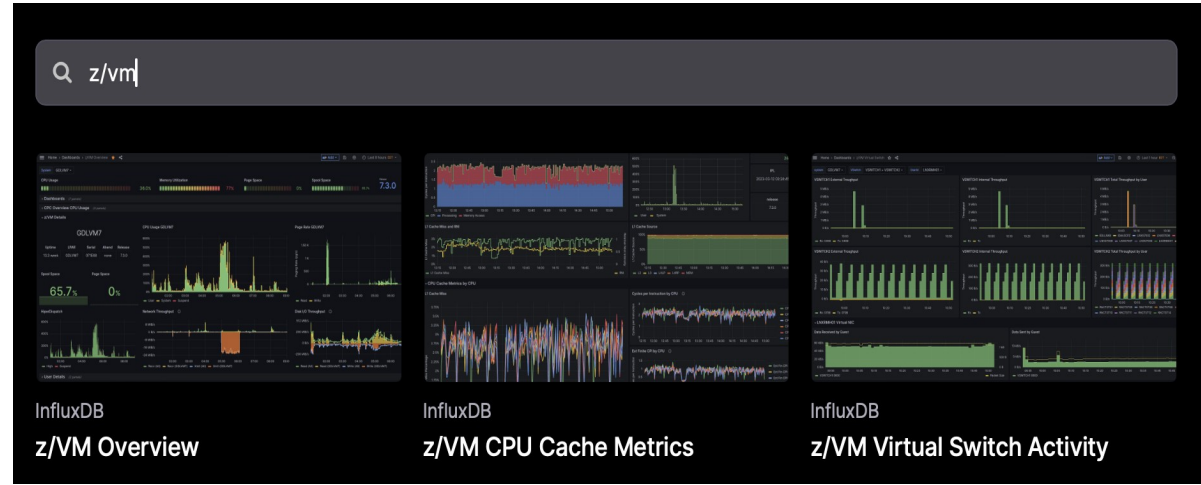
Max series:

Back Explore Delete Save & test

On the Grafana web site,
find the dashboards you
want to use

If Grafana has access to the
internet, click the button to
copy the dashboard ID

If not, Download the JSON
data for the dashboard



grafana.com
Open Source
Community Resources
Dashboard Templates

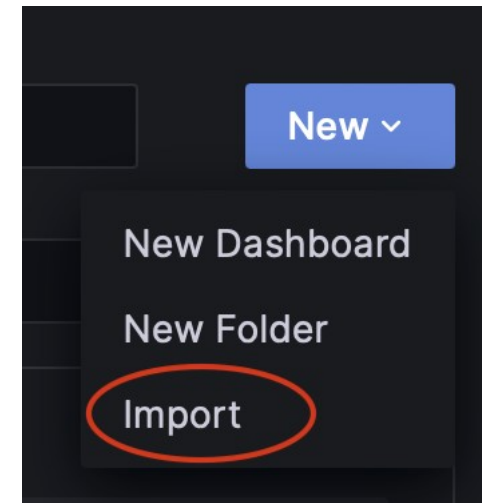
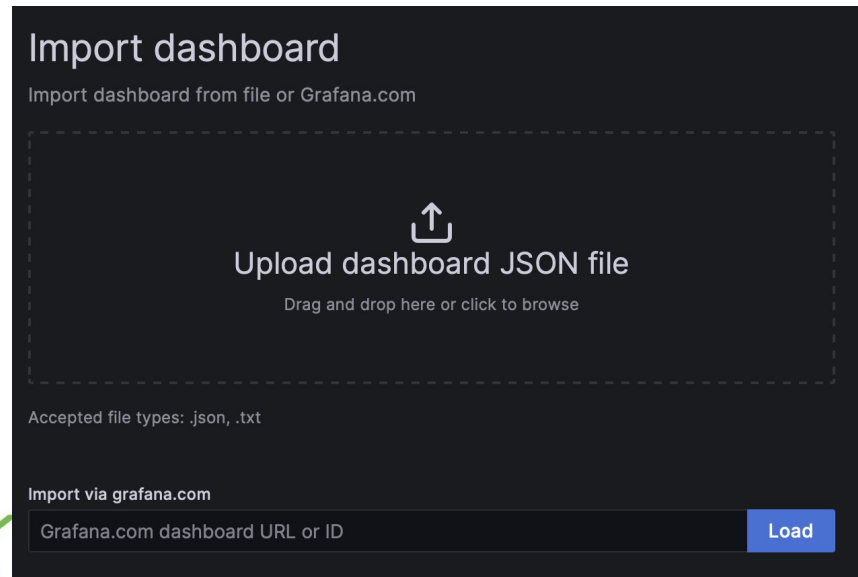
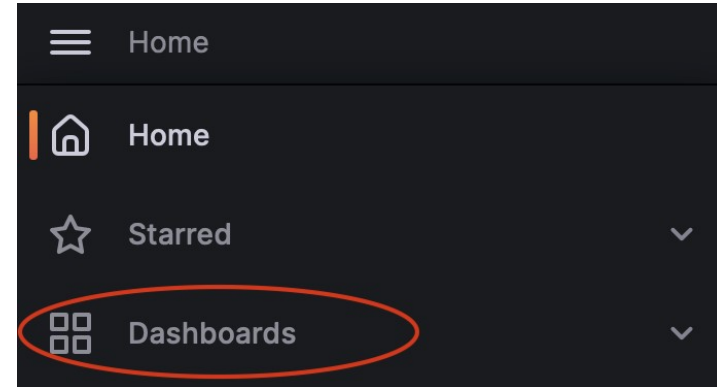
Import the dashboard template

Copy ID to clipboard

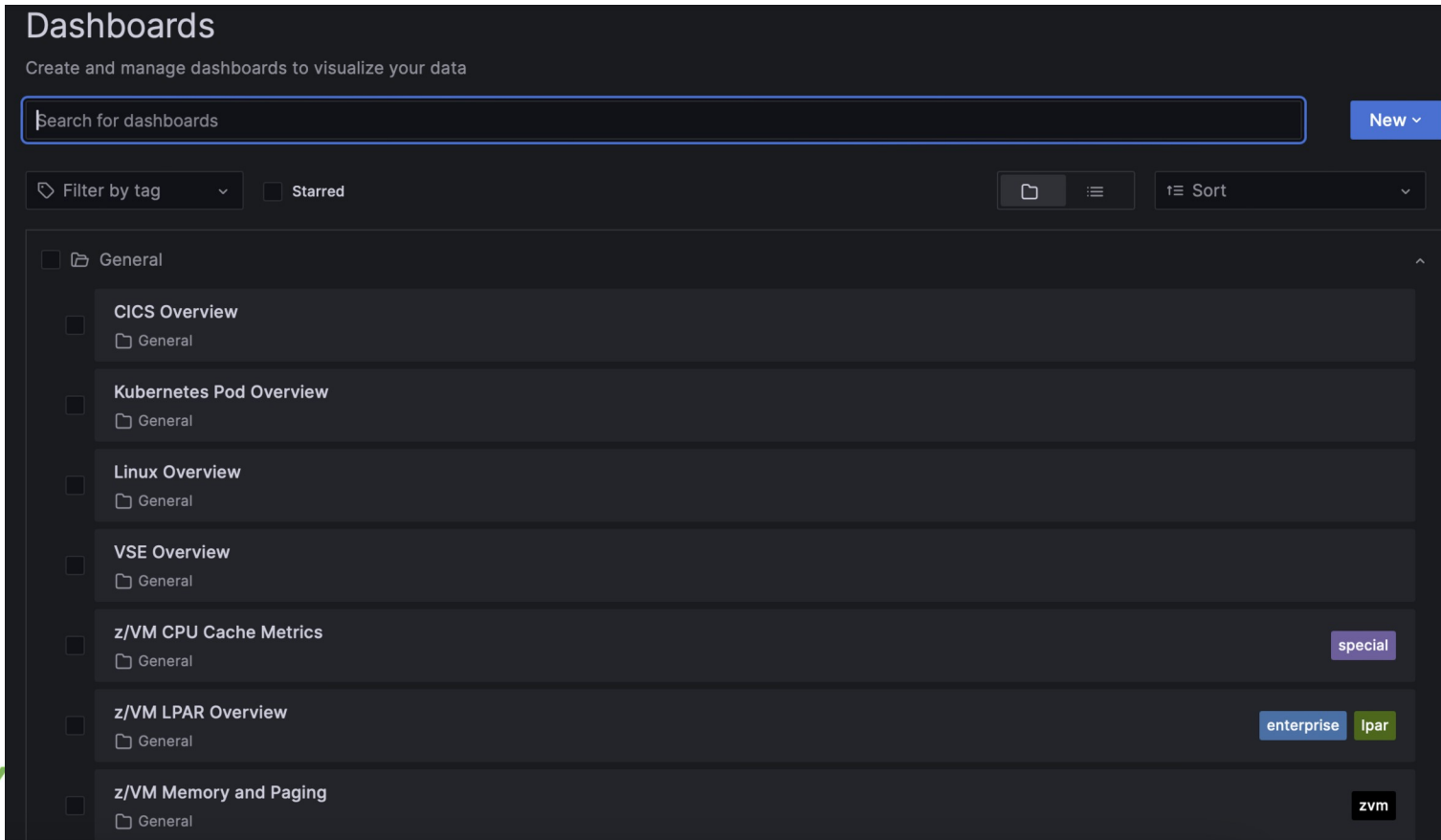
or

Download JSON

On your local Grafana, select Dashboards
Open the New menu, select Import
Paste the ID that was copied into the text box
Or upload the JSON
Later on the import screen is where the JSON can be pasted



When the dashboards are imported, they will all appear on the list



The screenshot shows the Grafana 'Dashboards' page. At the top, there is a search bar with the placeholder text 'Search for dashboards' and a 'New' button. Below the search bar, there are filters for 'Filter by tag' (a dropdown menu), 'Starred' (a checkbox), and 'Sort' (a dropdown menu). The main content area displays a list of dashboards under a 'General' folder. Each dashboard entry includes a checkbox, the dashboard name, a sub-folder icon labeled 'General', and a tag. The dashboards listed are:

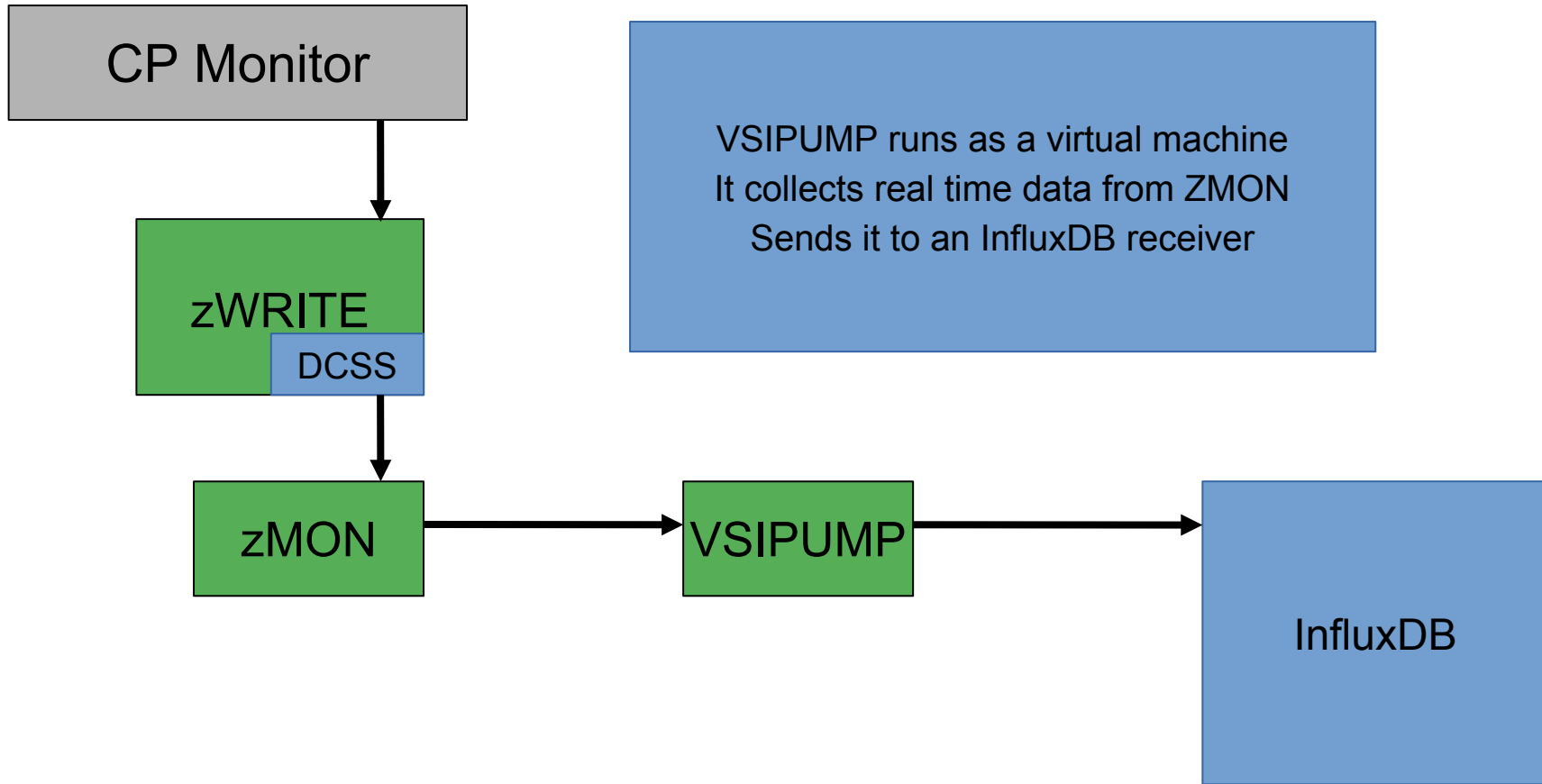
- CICS Overview (tag: special)
- Kubernetes Pod Overview
- Linux Overview
- VSE Overview
- z/VM CPU Cache Metrics (tag: special)
- z/VM LPAR Overview (tags: enterprise, lpar)
- z/VM Memory and Paging (tag: zvm)



VSIPUMP

- Delivered as a zVPS product package
- Runs in a virtual machine
- Collects realtime data every minute
- Connects to InfluxDB (V1.10 is tested) or OpenTelemetry
- Uses the same z/VM dashboards that are available from the Grafana web site
- Configure the IP address, userid/password, and optional collection features
 - Linux, VSE, CICS, Kubernetes, MongoDB

Infrastructure Overview

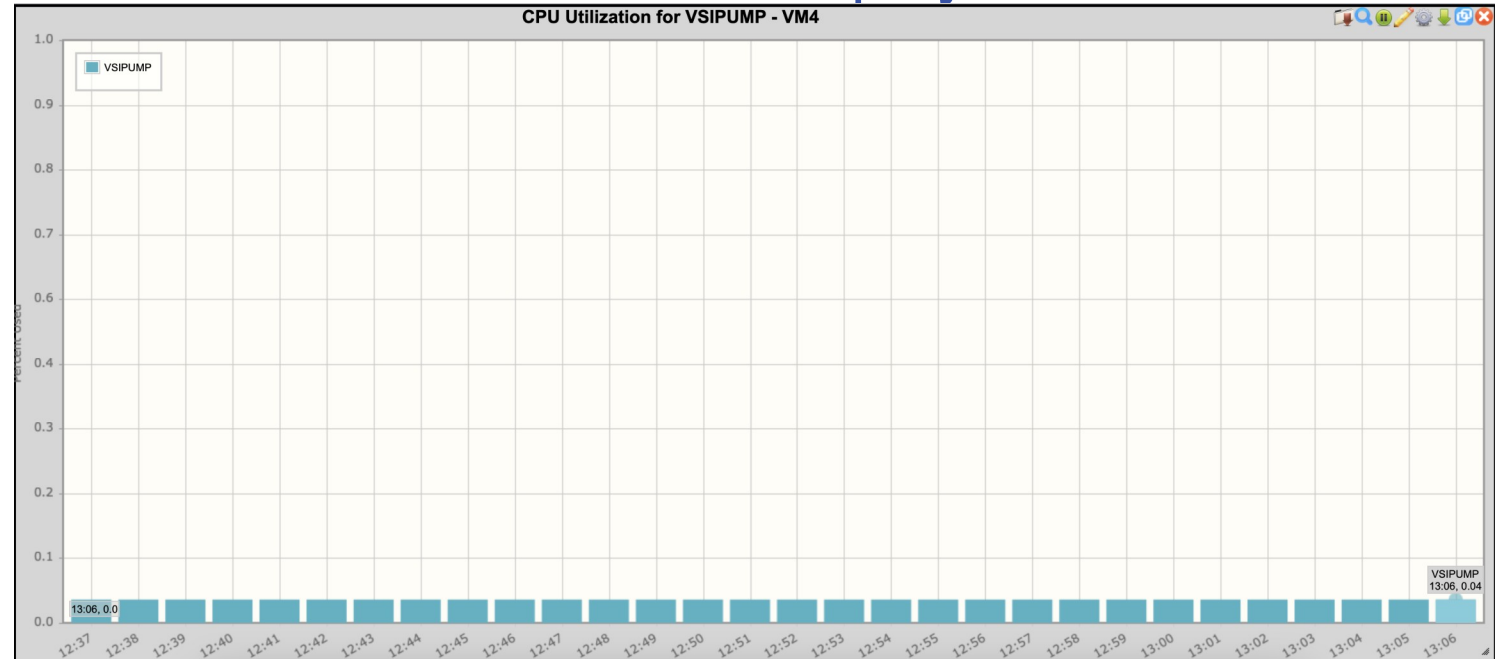


Collects >200 data elements every minute

Populates an Influx database

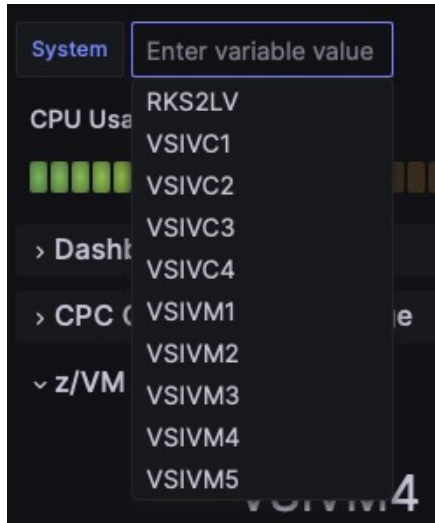
Grafana dashboards access the database to display the data

Using much
less than .1%
of a CPU




Point your web browser to the Grafana machine (port 3000)

Click on a dashboard (z/VM Overview)



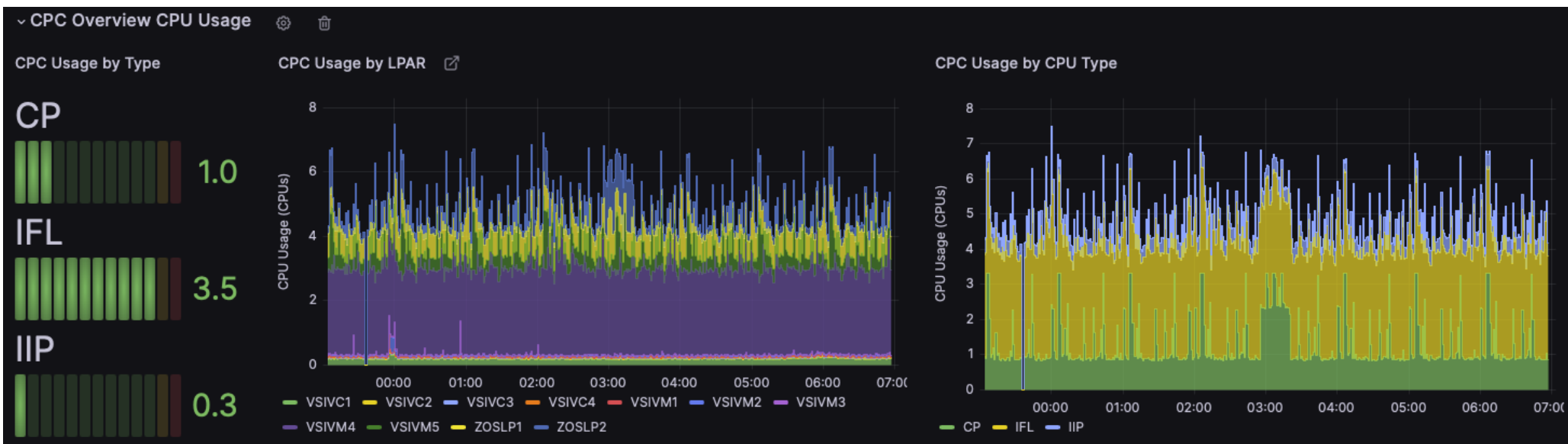
'Dashboards' panel contains a list of the other available dashboards

▼ Dashboards

VSIVM4 	z/VM z/VM Memory and Paging ☆ z/VM Overview ☆	Enterprise z/VM LPAR Overview ☆ z/VM Multi-System Overview ☆ z/VM SSI Overview ☆	Linux z/VM Virtual Switch Activity ☆	Disk I/O	Network I/O z/VM Virtual Switch Activity ☆	Special Topics z/VM CPU Cache Metrics ☆ z/VM Shared File System Usage ☆
---	--	--	--	-----------------	--	--

CPC Overview CPU Usage

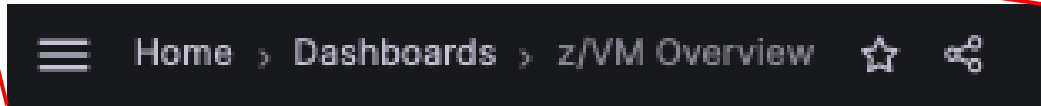
Each of the processor types and LPARs



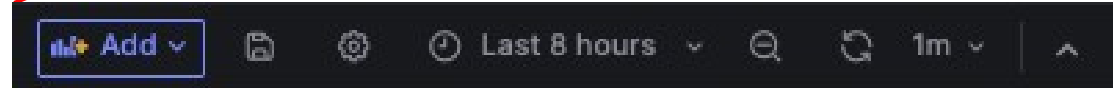
SSI Overview



Navigating



- 'Pancake' menu
- Current location
- Favorite
- Share



Absolute time range

From
2024-09-22 03:42:06

To
2024-09-22 19:42:06

Apply time range

It looks like you haven't used this time picker before. As soon as you enter some time intervals, recently used intervals will appear here.
[Read the documentation](#) to find out more about how to enter custom time ranges.

Browser Time United States, CDT UTC-05:00 [Change time settings](#)

- Search quick ranges
- Last 5 minutes
 - Last 15 minutes
 - Last 30 minutes
 - Last 1 hour
 - Last 3 hours
 - Last 6 hours
 - Last 12 hours
 - Last 24 hours
 - Last 2 days

- Add a visualization tool
- Save dashboard
- Configure dashboard
- Select time frame
- Refresh
- Select interval
- Collapse this menu

Multi-System Overview

System:

System: Selected (2)

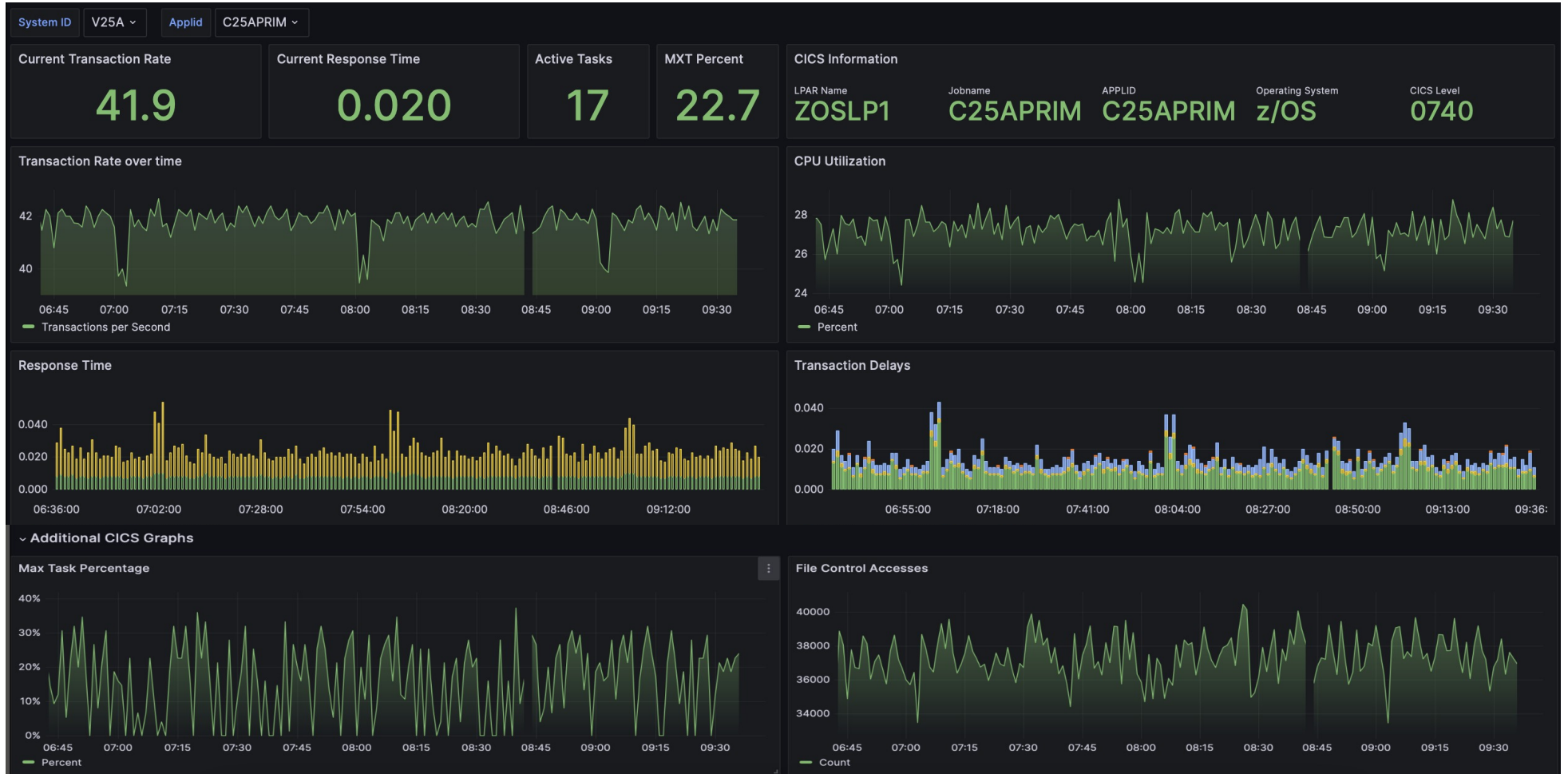
- Current Utilization
- CPU Utilization: RKS2LV
- VSIVC: VSIVC1, VSIVC2, VSIVC3
- VSIVM: VSIVM1, VSIVM2, VSIVM3, VSIVM4, VSIVM5



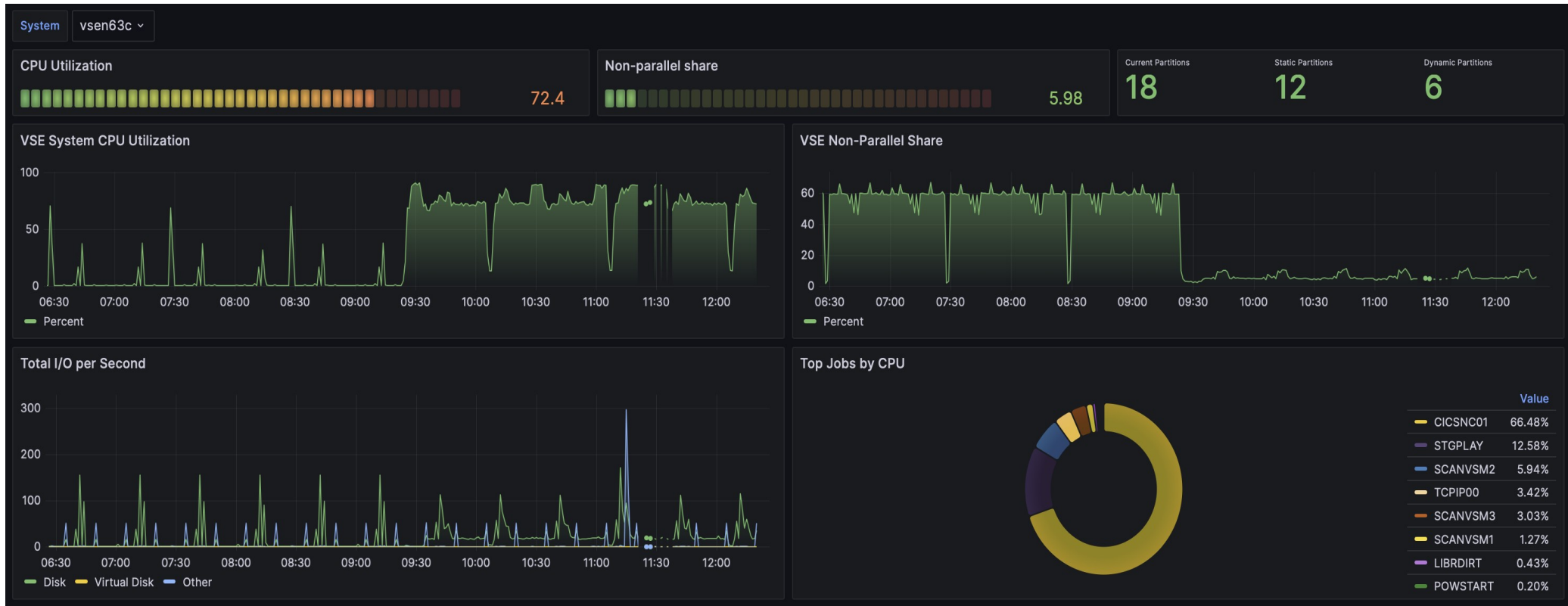
And Linux!



CICS data!



VSE data!



A customer request to provide data using Prometheus

- Grafana would access the Prometheus data

We accepted the challenge

Much different than InfluxDB

- Pull; instead of push

Configuration – prometheus.yml

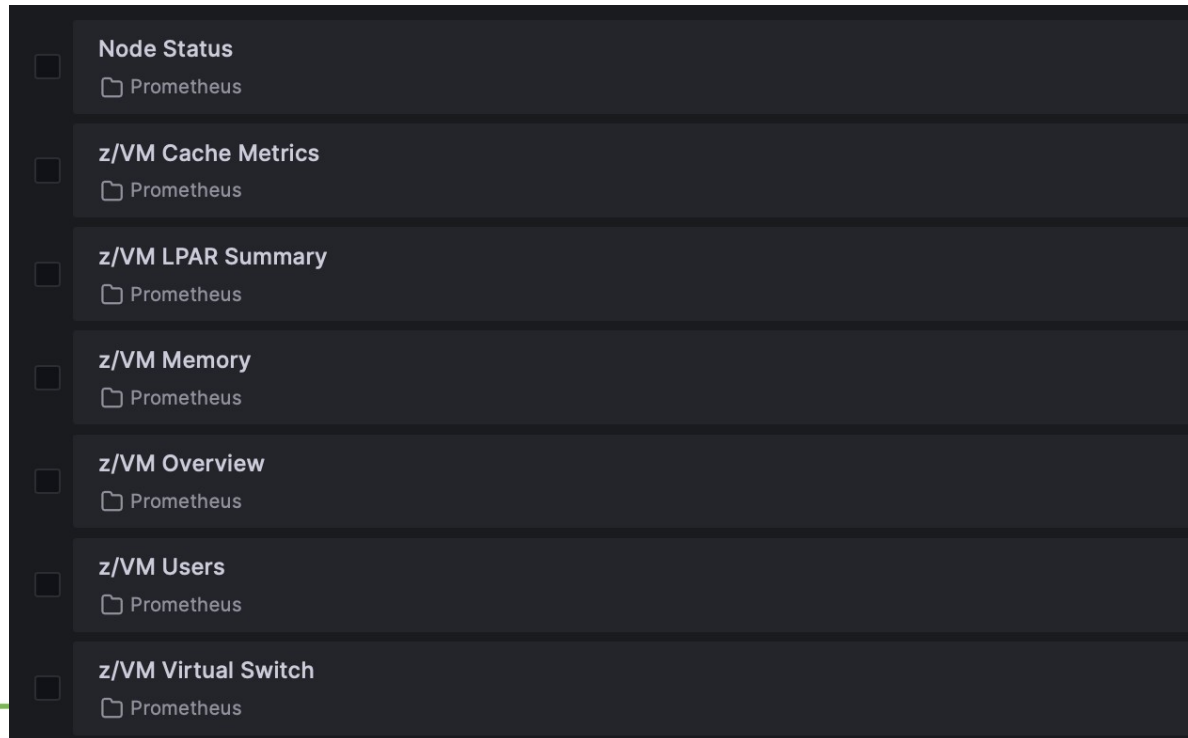
```
scrape_configs:  
  - job_name: 'prometheus'  
  
    # Override the global default and scrape targets from this job every 5 seconds.  
    scrape_interval: 5s  
  
    static_configs:  
      - targets: ['localhost:9090']  
  
# The job name is added as a label `job=<job_name>` to any timeseries scraped from this config.  
- job_name: "zVPS"  
  scrape_interval: 1m  
  metrics_path: '/metrics/'  
  
# metrics_path defaults to '/metrics'  
# scheme defaults to 'http'.  
static_configs:  
  - targets: [  
    '192.168.5.48', '192.168.5.44', '192.168.5.45'
```

Target status

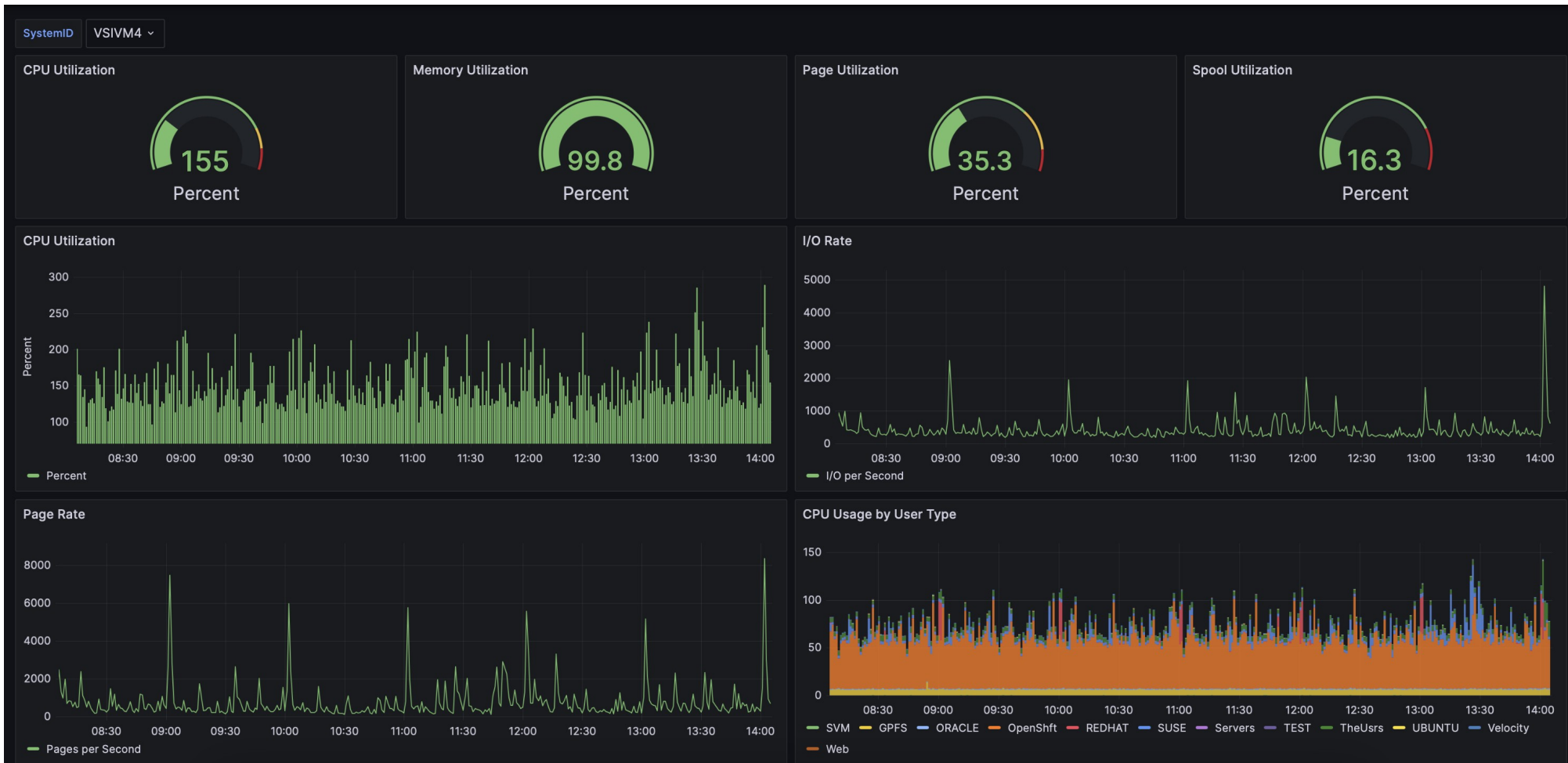
The screenshot shows the Prometheus Targets page. At the top, there's a navigation bar with 'Prometheus', 'Alerts', 'Graph', 'Status', and 'Help'. The 'Targets' section is active. Below the navigation, there are filters: 'All scrape pools', 'All', 'Unhealthy', and 'Collapse All'. A search bar is present with the text 'Filter by endpoint or labels'. On the right, there are status filters: 'Unknown', 'Unhealthy', and 'Healthy', all of which are checked. The main content area shows two groups of targets. The first group is 'prometheus (1/1 up)' with a 'show less' button. It contains one target: 'http://localhost:9090/metrics' with a state of 'UP', labels 'instance="localhost:9090"' and 'job="prometheus"', last scrape '49.32s ago', and scrape duration '13.136ms'. The second group is 'zVPS (3/3 up)' with a 'show less' button. It contains three targets: 'http://192.168.5.45/metrics/' (UP, instance="192.168.5.45:80", job="zVPS", 1m 21s ago, 43.182ms), 'http://192.168.5.44/metrics/' (UP, instance="192.168.5.44:80", job="zVPS", 1m 11s ago, 63.411ms), and 'http://192.168.5.48/metrics/' (UP, instance="192.168.5.48:80", job="zVPS", 1m 2s ago, 71.598ms).

Endpoint	State	Labels	Last Scrape	Scrape Duration	Error
prometheus (1/1 up) show less					
http://localhost:9090/metrics	UP	instance="localhost:9090" job="prometheus" ▾	49.32s ago	13.136ms	
zVPS (3/3 up) show less					
http://192.168.5.45/metrics/	UP	instance="192.168.5.45:80" job="zVPS" ▾	1m 21s ago	43.182ms	
http://192.168.5.44/metrics/	UP	instance="192.168.5.44:80" job="zVPS" ▾	1m 11s ago	63.411ms	
http://192.168.5.48/metrics/	UP	instance="192.168.5.48:80" job="zVPS" ▾	1m 2s ago	71.598ms	

A lot of the same data is being collected, 'scraped', by Prometheus
Similar dashboards have been designed



z/VM Overview



MongoDB Data



Visualization

the act or process of interpreting in visual terms or of putting into visible form

Deliver data for use by a non-native visualization tool

Use the tool to quickly analyze the data

Go back in time to determine what happened

Customers can easily design any dashboards they need

Standard visualization tools remain available (zVIEW)

Exciting News!!

Velocity Software is now your place for z/VM education!

- **Self-Study and Instructor-led classes**
- **Upcoming Instructor-led Class:**
 - **July 8-10 2026 – Modules 1, 2 and 3 (from our education page)**

Ask about it here at the workshop!

See our website – VelocitySoftware.com/Educate/Training

Send an email to – education@velocitysoftware.com